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VIJAYAKUMAR, KALLAMBELLA M	
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Please find below and/or attached an Office communication concerning this application or proceeding.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/520,311
Filing Date: January 05, 2005
Appellant(s): VAN BRUGGEN ET AL.

VAN BRUGGEN ET AL

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 05/14/2008 appealing from the Office action mailed 12/14/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

The description of claims 1-10 were rejected in Final Office action is incorrect, wherein claims 11-20 were rejected.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is incorrect.

Claims to be reviewed are 11-20 that includes three independent claims 11, 14 and 16.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 6,417,127	YAMAMOTO et al.	7-2002
US 2003/0125189	CASTRO et al.	7-2003
EP 1053983	YAMAMOTO et al.	5-2000

Webster Dictionary, Translucent, 2008.

Aptez et al, "Transparent Alumina: A Light-Scattering Model," J. Am Cer. Soc., V 86(3), March 2003, pp 480-486.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 11-14 and 16-20 are rejected under 35 U.S.C. 103(a) as obvious over Castro et al (US 2003/0125189).

Castro et al teach a polycrystalline translucent aluminum oxide ceramic (PCA) material having an average grain size of no greater than 1.0 micron, and a Contrast Ratio value of less than about 0.4 (Abstract; 0044). PCA was a compact with substantially theoretically density (P-0054, 58) or 100% theoretical density (P-0107, L-7 and 14), and with substantially zero porosity (0006). The prior art further teaches making the PCA by dispersing/deagglomerating components containing alumina particles in

water forming a slurry (99.99% pure TM-DAR alumina with a particle size of 0.18 micron) (P 0053-54, 0097), ClPing the mixture to at least 25% porosity (0055), calcining the sample to attain at least 58% theoretical density (0056), sinter between 1200-1300C attaining 96-98% theoretical density, and densifying the composite by HIPing between 1200-1450 C and 110-210 MPa attaining PCA with full transclucency, full density and zero porosity (0059, 0107, 0127). Specific example of PCA had an alumina crystal size of 0.8 micron and the transmittance of at least about 40% at 550 nm and ~50% at 650 nm (0046, Fig-10; 0131, Ex-3). The composition contained up to about 0.5 wt% of the sintering aids such as MgO, Y2O3, ZrO2, HfO2 and CaO that can be used either singly or in a combination (0060). The prior art further teaches using the PCA composition in a sodium vapor lamp envelope (Discharge lamp) (P0031, Claim-12).

The prior art is silent about the relative density of the composition being greater than 99.95% and the RIT ≥ 30% under specific measurement conditions per claims 11, 14 and 16.

However, the prior art teaches the fully translucent and dense PCA composition with substantially zero porosity and a relative density greater than about 99.8%. The prior art further teaches making the composition by blending the component mixture containing sintering aids, ClPing the blend, forming a green body, calcining the green body in a multistep heating process to attain a density of 96-98% and then HIPing under inert atmosphere by varying a combination of temperature and pressure (Para 0053, 0055-0059) to obtain a fully dense material. It would have been obvious to a person of ordinary skilled in the art to optimize the process conditions of Castro et al to attain a non porous, high density PCA that is transparent for a lamp by routine experimentation with reasonable expectation of success, and generally, differences in concentration or temperature or pressure or density will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature or pressure or density is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). With regard to the instant claimed optical properties of PCA, the prior art composition will be substantially same as that taught by the applicants, and having same utility as enclosures for high-pressure discharge lamps, and

the applicant has the burden of showing by tangible evidence that they are not." In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990); see also In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971).

With regard to the limitation of RIT ≥ 30% under specific measurement conditions (i.e. reflection+ refraction+diffusion ≤ 70 %), the prior art PCA is made from components and the process conditions that are similar to that claimed by the appellants (Specification, Pg-4, Ln 1-25) and having similar structure to that claimed by the appellants and further having same common utility as a discharge lamp shroud, and similar compositions are expected to possess similar properties, and if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

With regard to claims 12-13, the prior art teaches PCA composition containing up to about 0.5 wt% of the sintering aids such as MgO, Y2O3, ZrO2, HfO2 and CaO selected from a small group of aids that can be used either singly or in combination (0060), and the instant claimed ranges lie with in the prior art range, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

With regard to method in claim 17, the prior art teaches all the elements of the instant process steps, and the instant claimed step would have been obvious functionality of the process.

With regard to the claims 18-20, the prior art teaches measuring the transmission/ translucency using a spectrophotometer by scanning the wave length in the range of 350-800 nm (typically using a quartz halogen lamp and monochromator) that covers the instant claimed wavelength of 645 nm and it would have been obvious to measure the transmission properties using a laser spectrometer including red laser at 645 nm as functional equivalent of the light source in the measurements with reasonable expectation of success. The apertures and the distance would have been obvious variables of measurements using the laser beam as radiation source along with the necessary optics.

2. Claim 15 is rejected under 35 U.S.C. 103(a) as obvious over Castro et al (US 2003/ 0125189) in view of Yamamoto et al (US 6,417,127).

The disclosure on the composition and making of PCA as set forth in rejection-1 under 35 USC 103(a) is herein incorporated.

The prior art fails to teach the discharge lamp containing a metal halide per the claim.

In the analogous art, Yammamoto et al teach using the PCA as outer tube of a metal halide or sodium vapor lamp (Abstract, Cl-1, Ln 6-15).

It would have been obvious to a person of ordinary skilled in the art to have used the PCA of Castro et al as an envelope of a metal halide lamp with reasonable expectation of success because Yamamoto et al teach the transparent PCA applications in a genus of lamps containing a metal halide and sodium vapor lamp that encompasses the species of sodium vapor lamp of Castro et al, and the combined prior art teaching is suggestive of the claimed discharge lamp.

3. Claims 11-20 are rejected under USC 103(a) as obvious over Yamamoto et al (US 6,417,127).

Yamamoto et al. teach a translucent sintered PCA with at least one characteristic features: (1). A mean particle size of crystal particles formed inside the ceramic is not larger than 1.0 micron, (2). A mean aspect ratio thereof is from 1.0 to 1.5, (3). A density thereof is substantially a theoretical density, (4). A light transmittance through its thickness of 1 mm is at least 50%, and (5). A mean facet length of crystal particles formed inside the ceramic is not longer than a maximum wave length of the light (Abstract). The PCA contained 0.02-2.0 mol % of oxide of metal belonging to IIIA and/or IVA group (excluding Ti) such as oxides of Y, Yb, **Zr**, Sc, La and Lu and **Mg** (Abstract; Cl-13, Tbl-5, Ex-9; Cl-14, Tbl-6, Ex-9). The PCA further had a density of at least 3.98 g/cm.sup.3, a mean crystal particle size of 0.3-1.0 micron, its bending strength of at least 1900 MPa and its Vickers hardness of at least 850 at 1000.degree.C (Cl-4, Ln 34-54; Cl-6, Ln 63-68; Cl-7, Ln 13-18;). A 0.5mm thick sample containing 0.1 mol% (1000 ppm) MgO had a mean particle size of 0.5 micron and linear transmittance of 40% measured with a spectrometer (Cl-14, Tbl-6, Ex-9). The prior art teaches making the PCA composition by blending

the component mixture containing high purity alumina with a particle size of 0.22 micron and sintering aids forming a slurry, drying the blend forming secondary particles, CIPing the blend of secondary particles, calcining in a multi-step heating process for about 2 hrs and then HIPing under inert atmosphere by varying a combination of temperature and pressure forming a dense transparent body at temperatures greater than 1200C for a period of 1-hr (Cl-8, Ln 36-56; Ex-1; Tables 1-2 and 5-6; Ex 9-12).

The prior art is silent about the RIT per the claims or fails to teach the particle size of alumina or specific process steps per claim-16 or the measurements with a monochromatic wavelength of 645 nm per claims 18-20.

With regard to claim 11, it would have been obvious to a person of ordinary skilled in the art to have varied the grain size of sintered alumina in the range of 200-700 nm with reasonable expectation of success because the prior art is suggestive of obtaining high translucency/transparency by varying the grain size in substantially pore-less and a fully dense doped PCA (Cl-2, Ln 36-47; 53-59; Cl-7, Ln 37-43; Cl-8, Ln 13-16) to attain the claimed composition and characteristics. With regard to the limitation of RIT in the claims, the prior art composition is substantially same as that taught by the appellants, and having the same utility as enclosures for high-pressure discharge lamps, and similar compositions are expected to possess similar properties and characteristics, and the applicant has the burden of showing by tangible evidence that they are not." In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990); see also In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971). Further See Aptez et al (J. Am. Cer. Soc., 2003 (March), 86(3), 480-486; Abstract, Pg-481, Sec-II, Experimental; Fig 1 and 8-9; Pg 486, Cl-2, Ln 13-15).

With regard to claims 12-13, the prior art teaches the addition of 0.02-2.0 mol % of oxide of metal belonging to IIIA and/or IVA group (excluding Ti) such as oxides of Y, Yb, Zr, Sc, La, Lu and **Mg** in a small group of additives, wherein instant claimed ranges overlap with the prior art range, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

With regard to claims 14-15, the prior art teaches using the PCA in a sodium vapor lamp or a metal halide lamp (Cl-1, Ln 6-15).

With regard to method in claims 16-17, the prior art teaches making the PCA composition by a process similar to that claimed by the applicants while it differs from it in using the alumina particles with a particle size of 0.22 microns, casting dried slurry and HIPing for 1-hr. With regard to the particle size, the prior art particle size of 0.22 micron lies close to instant claimed particle size of 0.2 micron or less, and a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.). With regard to slurry casting of the composition, the prior art teaches molding the components, and Omission of an Element and Its Function Is Obvious If the Function of the Element Is Not Desired Ex parte Wu , 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989) <MPEP 2144.04>. With regard to HIPing for more than 2 hrs, the prior art teaches HIPing the composition, and Generally, differences in concentration or temperature or time will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature or time is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

With regard to the claims 18-20, the prior art teaches measuring the transmission/ translucency using a spectrophotometer by scanning the wave length in the range of 350-800 nm (typically using a quartz halogen lamp and monochromator) that covers the instant claimed wavelength of 645 nm and it would have been obvious to measure the transmission properties using a laser spectrometer including red laser at 645 nm as functional equivalent of the light source in the measurements with reasonable expectation of success. The apertures and the distance would have been obvious variables of measurements using the laser beam as radiation source along with the necessary optics.

4. Claims 11-20 are rejected under 35 USC 103(a) as obvious over Yamamoto et al (EP 1053983).

Yamamoto et al. teach a translucent sintered PCA with at least one characteristic features: (1). A mean particle size of crystal particles formed inside the ceramic is not larger than 1.0 micron, (2). A mean aspect ratio thereof is from 1.0 to 1.5, (3). A density thereof is substantially a theoretical density, (4). A light transmittance through its thickness of 1 mm is at least 50%, and (5). A mean facet length of crystal particles formed inside the ceramic is not longer than a maximum wave length of the light (Abstract).The PCA contained 0.02-2.0 mol % of oxide of metal belonging to IIIA and/or IVA group (excluding Ti) such as oxides of Y, Yb, Zr, Sc, La and Lu and Mg (Abstract; Pg-12, Tbl-5, Ex-9; Pg-13, Tbl-6, Ex-9). The PCA further had a density of at least 3.98 g/cm.sup.3, a mean crystal particle size of 0.3-1.0 micron, its bending strength of at least 1900 MPa and its Vickers hardness of at least 850 at 1000.degree.C (0024-26, 0036, 0037, 0039). A 0.5mm thick sample containing 0.1 mol% (1000 ppm) MgO had a mean particle size of 0.5 micron and linear transmittance of 40% measured with a spectrometer (Pg-13, Tbl-6, Ex-9). The prior art teaches making the PCA composition by blending the component mixture containing high purity alumina with a particle size of 0.22 micron and sintering aids forming a slurry, drying the blend forming secondary particles, CIPing the blend of secondary particles, calcining in a multistep heating process for about 2 hrs and then HIPing under inert atmosphere by varying a combination of temperature and pressure forming a dense transparent body at temperatures greater than 1200C for a period of 1-hr (0057-58; Ex-1; Tables 1-2 and 5-6; Ex 9-13).

The prior art is silent about the RIT per the claims or fails to teach the particle size of alumina or specific process steps per claim-16 or the measurements with a monochromatic wavelength of 645 nm per claims 18-20.

With regard to claim 11, it would have been obvious to a person of ordinary skilled in the art to have varied the grain size of sintered alumina in the range of 200-700 nm with reasonable expectation of success because the prior art is suggestive of obtaining high translucency/transparency by varying the grain size in substantially pore-less and a fully dense doped PCA (0012-0015) to attain the claimed composition. With regard to the limitation of RIT in the claims, the prior art composition is substantially

same as that taught by the applicants, and having same utility as enclosures for high-pressure discharge lamps, and similar compositions are expected to possess similar properties and characteristics, and the applicant has the burden of showing by tangible evidence that they are not." In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990); see also In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971).

With regard to claims 12-13, the prior art teaches the addition of 0.02-2.0 mol % of oxide of metal belonging to IIIA and/or IVA group (excluding Ti) such as oxides of Y, Yb, Zr, Sc, La, Lu and **Mg** in a small group of additives, wherein instant claimed ranges overlap with the prior art range, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

With regard to claims 14-15, the prior art teaches using the PCA in a sodium vapor lamp or a metal halide lamp (0002).

With regard to method in claims 16-17, the prior art teaches making the PCA composition by a process similar to that claimed by the applicants while it differs from it in using the alumina particles with a particle size of 0.22microns, casting dried slurry and HIPing for 1-hr. With regard to the particle size, the prior art particle size of 0.22 micron lies close to instant claimed particle size of 0.2 micron or less, and Similarly, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.). With regard to slurry casting of the composition, the prior art teaches molding the components, and Omission of an Element and Its Function Is Obvious If the Function of the Element Is Not Desired Ex parte Wu , 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989) <MPEP 2144.04>. With regard to HIPing for more than 2 hrs, the prior art teaches HIPing the composition, and Generally, differences in concentration or temperature

or time will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature or time is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

With regard to the claims 18-20, the prior art teaches measuring the transmission/ translucency using a spectrophotometer by scanning the wave length in the range of 350-800 nm (typically using a quartz halogen lamp and monochromator) that covers the instant claimed wavelength of 645 nm and it would have been obvious to measure the transmission properties using a laser spectrometer including red laser at 645 nm as functional equivalent of the light source in the measurements with reasonable expectation of success. The apertures and the distance would have been obvious variables of measurements using the laser beam as radiation source along with the necessary optics.

(10) Response to Argument

Appellant's arguments in the supplemental appeal brief filed 05/14/2008 have been fully considered. First, the "RIT" <Real-in-line transmission> that is the core of instant claims is addressed.

RIT has been defined by the applicants as (Specification: Pg-2, Ln 7-12)

$$RIT = (1 - R)\exp\left[-(3\pi^2 G d \Delta n^2) / (2\lambda_o^2)\right]$$

where **R** is the coefficient of surface reflection (0.14 for A1203), **d** is the sample thickness, **G** is the average crystal size, **Δn** is the effective birefringence of alpha-alumina (0.005) calculated as the weighted average of the refractive index differences between each of the main optical axes, and λ_o is the wavelength of the monochromatic incident light in vacuum.

The RIT concept was published by **Rolf Aptez and van Bruggen** <APPLICANT> in a publication entitled "Transparent Alumina: A Light-Scattering Model," in J. Am. Cer. Soc., 86(3), pp 480-86, **March 2003**.

For a given sample of polycrystalline alumina, R and Δn are constants. At a constant thickness of d of the sample and the wave length λ_o in a measurement, the **RIT is a function of crystal size G**.

λ_o can vary from UV-FIR (See Yamamoto, EP 1053983, P-0007) i.e. 180 nm- 6000 nm. i.e. **For a given crystal size, RIT is a function of wave length of monochromatic light.**

The instant claims 11, 14 and 16 do not specify the wave length, and the RIT could be obtained from any monochromatic source in the range of at least near UV-far infrared region.

In response to Castro and Yamamoto et al. being silent on RIT of a polycrystalline alumina **[PCA]** (Res, Pg-10,Ln 4-10), Castro has a filing date of Dec 28, 2001, Yamamoto et al. (EP) has a publication date of Nov 22, 2000 and Yamamoto et al. (US) has a filing date of May 19, 2000, and they were in no way to express their transmission values in terms of Applicant's RIT that was published in March 2003.

In response to the argument that "Carbon and diamond have a "similar composition" too, and yet have vastly different properties, including vastly different transmissive properties," (Res, Pg-11, Ln 3-5) carbon and diamond are allotropes with different crystal structure, while the prior art compositions are polycrystalline alumina's with similar crystal structure and composition as claimed.

The argument that Castro and Yamamoto recite their ceramics to be "transclucent" and do not teach a ceramic with RIT ≥30% will be addressed in the following paragraphs separately over Castro and Yamamoto et al. (US and EP).

Transclucent means: a). **"Clear transparent"** or, b). transmitting and diffusing light (See Webster dictionary).

(i). CASTRO (US 2003/0125189):

In response to Castro teaching a translucent rather than transparent (PG Pub Para 0041) (Res, Pg-11, Ln 12-16), the prior art disclosure on the PCA is not limited to dental implants/tooth and clearly teaches its use in the sodium vapor lamp envelopes (P-0031; Clm-12) where in the requirement for transparency along with strength of the envelope would be obvious.

Castro teaches making PCA by milling high purity sub-micron/nanoparticles (0.5 micron), deagglomerating with ultrasonic (P 0053-55, 97) adding a sintering aid such as MgO either singly or in combination (P-0060), and sinter in a multistep process and HIP to achieve substantially theoretically dense compact (P-0054, 58) or 100% theoretical density (P-0107, L-7 and 14) i.e. sintering and controlling grain size and properties with zero porosity. Castro teaches all the elements of the PCA and its method of making that are similar to that disclosed by the applicants including the use of TM-DAR alumina powder (P-0099, Ln-1) in forming PCA with crystal size no greater than 1 micron, wherein smaller the grain size of the PCA contributes to significant strength without detrimentally affecting

transclucency (P-0030). Lower values of contrast ratio (CR) indicates greater levels of light transmissivity and prefers a value less than 0.4, i.e. 0< CR <~0.4 (P-0043, Ln 8-9; P-0044, Ln 4-5). The prior art further teaches PCA with a transmittance of 70% @ 650 NM (Abstract, Fig-7) whose crystal grains are no greater than 1.0 micron and a contrast ratio to be less than 0.4 (Abstract, P-0044), wherein lower contrast ratio indicate greater levels of transmissivity (P-0044) i.e. increasing light transmission or transparent. The PCA has at least 99% theoretical density (P-0033) or theoretical density that overlaps with claimed range of >99.95 % Th.

The prior art clearly teaches the utility of PCA in sodium vapor lamps and windows (P-0031, Ln 7-9), and it would have been obvious to a person of ordinary skilled in the art to optimize the process conditions to arrive at a more transparent PCA, i.e. PCA with less contrast ratio, for the sodium vapor lamps/windows because transparency is the more desired for these applications resulting in more through put of the light because lower contrast ratio makes it more transparent. "[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).

(ii). YAMAMOTO et al (EP 1053983):

In response to Yamamoto et al. (US/EP) teaching a translucent rather than transparent (Res, Pg-11, Ln 12-16), Yamamoto et al. teach PCA to possess light transmittance and transparency, with application in outer tubes for high pressure sodium lamps (Abstract, Ln 3-6).

With regard to the argument that, both Yamamoto et al. and Yamamoto et al- EP '983 specifically recite in the title a "translucent polycrystalline ceramic." (Emphasis added) (Res, Pg-11, Ln 16-19), the translucent includes transparent (see Webster dictionary), and material with RIT of 30% (close analogy of in-line transmission) need not be fully transparent and can obviously possess some degree of diffusion or refraction in the transmitted light.

With regard to the argument that Yamamoto et al.'s data corresponds to an RIT of 25% (Res, Pg-12, Ln 1-3), it is not commensurate in scope with the instant claim limitation using a "light" that includes at

least near UV to Far infrared regions as claimed, and RIT is a function of wavelength when all the parameters are constant in the applicant's equation used for RIT calculation.

Even if the RIT calculations of prior art PCA by the appellants are correct, the prior art composition, its structure, its method of making, and its utility are similar to that claimed by the appellants, wherein calculated RIT lies close to instant claimed ≥ 30%, and a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.).

With regard to the argument that, Yamamoto et al.- EP '983 would have disclosed a microstructure with an RIT of at least 30%, if the ceramic of Yamamoto et al.- EP '983 did indeed have such properties, particularly since Yamamoto-EP983 strives "to provide a translucent polycrystalline ceramic having a good strength and hardness, capable of transmitting light through the ceramic" (Yamamoto-EP-983, page 2, paragraph [0007] ; emphasis added) <Res, Pg-12, Ln 3-9>, Yamamoto et al. teach attaining all the desired parameters of PCA including the mean particle size to be 0.3-1.0 micron, the facet length of the crystal particle to be not longer than the maximum wave length of the light and its utility in a lamp (Abstract). The prior art further teaches transparency of the crystal particles and facet lengths are controlled to be smaller than 0.3 micron in size and 200 nm in length respectively (P-0030), and it would have been obvious to a person of ordinary skilled in the art to have optimized crystal size of the PCA as a function of its utility.

Appellant's argument that the ceramics disclosed in Castro, Yamamoto et al. and Yamamoto et al.- EP '983 are not similar enough to the polycrystalline alumina component as recited in independent claims 11, 14 and 16 is noted (Res, Pg-12, Last Para), but fails to overcome the prima facie obviousness established in the rejections under 35 USC 103(a) over the prior arts.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Kallambella Vijayakumar/
July 18, 2008.
(Kallambella Vijayakumar)

Conferees:

/Kathryn Gorgos/

Kathryn Gorgos

Appeals Specialist, TC 1700

/Stanley Silverman/

Supervisory Patent Examiner, Art Unit 1793